

Customer No.: 31561  
Application No.: 10/065,610  
Docket No.: 09668-US-PA

**REMARKS**

**Present Status of Application**

The Office Action mailed September 13, 2005, objected claim 15 for informalities. The drawings are objected for failing to show specific details enumerated in the specification. Claims 1-15 were rejected under U.S.C. 112, first paragraph as failing to comply with the enablement requirement.

Claim 1 has been amended, while claims 7 and 9-15 have been cancelled. New claim 16 has been added. The title of the specification has been amended for clarification purposes. Drawings have been amended for correcting informalities. Applicant believes that these changes do not introduce new matter and reconsideration of those claims is respectfully requested. In view of the above amendments and the following discussions, a notice of allowance is respectfully solicited.

**Discussion for objections of claims and drawings**

Claim 15 was objected for informalities.

Claim 15 has been cancelled.

The drawings are objected for failing to show specific details enumerated in the specification.

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In response thereto, Applicants would like to thank the Examiner for pointing out the informalities and accordingly Applicants amended Figure 1 for adding the missing reference number 106. Figure 2 has been amended by marking the axis z, x-y plane and size D. Formal replacement sheets of Figures 1 and 2 have been submitted in compliance with 37 CFR 1.121(d).

Withdrawal of these objections is respectfully requested.

**Discussion for objections and 35 U.S.C. 112 rejections**

Claims 1-8 were rejected under U.S.C. 112, first paragraph as failing to comply with the enablement requirement, especially for "measuring the translocation time of each nucleotide".

Accordingly, claim 1 has been amended for clarification purposes, to recite "...to control a translocation time of each nucleotide being a multiple of a basic time unit related to a period of the rotating electric field respectively" and "measuring the translocation time of the nucleotides of the nucleic acid sequence and a blockage current of each of the nucleotides over a time and analyzing changes of the blockage currents over the time for the nucleotides".

As recited in amended claim 1, the use of the rotating electric field for controlling "a translocation time of each nucleotide being a multiple of a basic time unit related to a

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period of the rotating electric field respectively", although the translocation time for each (kind of) nucleotide is constant, the translocation time of the nucleotides of the nucleic acid sequences can be measured for further analysis, and can be used for determining the numbers of repeating nucleotides in the sequence if applied for sequencing methods. The detail descriptions of further analysis are provided in paragraphs [0041]-[0046] of the specification.

Claims 1-15 were rejected under U.S.C. 112, first paragraph as failing to comply with the enablement requirement.

Claim 1 has been amended as follows:

1. *A method for controlling a nucleic acid sequence, suitable for determining a sequence of the nucleic acid sequence with a thin film having a pore, comprising:  
disposing at least a nucleic acid sequence on the thin film, wherein the nucleic acid sequence comprises a plurality of nucleotides;  
applying an electric field perpendicular to the thin film, so that the nucleic acid sequence is driven to pass through the pore of the thin film, wherein an adjustable rotating electric field parallel to the thin film is applied simultaneously, in order to control a translocation time of each nucleotide being a multiple of a basic time unit related to a period of the rotating electric field respectively; and  
measuring the translocation time of the nucleotides of the nucleic acid sequence and a blockage current of each of the nucleotides over a time and analyzing changes of the blockage currents over the time for the nucleotides.*

At first, the amended claim 1 is directed to the method for controlling a nucleic acid sequence, instead of a nucleic acid sequencing method. Hence, the issues indicated by the Office Action, including discriminating different base pairs of the double-stranded

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or modified nucleic acid sequences or unpredictability of the art relating the formation of the nanopore, need not to be discussed or considered as a result of the amendments made to the claims.

"[T]he enablement requirement of § 112 was satisfied by disclosure of detailed, claimed.....circuitry without requiring detailed disclosure of all related, unclaimed circuitry with which the .....might be interfaced." *DeGeorge v. Bernier*, 768 F.2d 1318, 226 USPQ 758 (Fed. Cir. 1985).

Regarding to the issues of "quantity of experimentation" for the device required to practice the method, since the amended claims are now related to the methods for controlling the nucleic acid sequence *comprising applying an electric field and an adjustable rotating electric field*, the specification has provide sufficient disclosure to one skilled in the art and the descriptions are provided in paragraphs [0026]-[0029]. For one skilled in the art, descriptions provided in paragraphs [0026]-[0029] are sufficient to reduce the method of this invention to practice. For example, according to the specification, two set of parallel electrode pairs having a 90-degree phase difference are used to generate a rotating electric field. Therefore, the method of this invention (the method for controlling a nucleic acid sequence) requires no particular apparatus and can be reduced to practice to one skilled in the art.

Furthermore, working examples are provided in paragraphs [0036]-[0041] for

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adjusting the frequency ( $\omega$ ) of the rotating electric field and for controlling the translocation time of the nucleotides.

The court *In re Vaeck*, 947 F. 2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) has pointed out that "In doing so we do not imply that patent applicants in art areas currently denominated as "unpredictable" must never be allowed generic claims encompassing more than the particular species disclosed in their specification."

Further, for other concerns of unpredictability from the Office Action, enablement is not required to work perfectly under all conditions.

"The mere fact that the system has some drawbacks, or that under certain postulated conditions it may not work ... does not detract from the operability of the disclosed equipment to perform its described function." *Decca, Ltd. v. United States*, 210 Ct.Cl. 546, 544 F.2d 1070, 191 USPQ 439(Ct.Cl.1976).

Accordingly, reconsideration and withdrawal of these rejections under 35 USC 112 are respectfully requested.

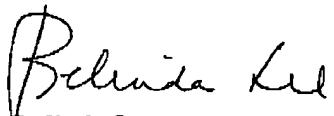
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**CONCLUSION**

In view of the foregoing, it is believed that all pending claims are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

Respectfully submitted,

Date : Dec. 13, 2005

  
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**AMENDMENTS**

**To the Drawings:**

Please amend FIG. 1 and FIG. 2 in the drawings as shown in the separate accompanying replacement sheet. More specifically, in Figure 1, the missing reference number 106 has been added and in Figure 2, the axis z, x-y plane and size D have been marked.